Beamline 33-BM / UNI-CAT

Scientific focus: Materials science and condensed matter physics

Scientific programs: Materials science, ceramic science, phase transitions, surface science, thin-film structure and growth, and materials physics

Optics & Optical Performance

- 4–40 keV energy range
- focused beam size 280 μm hor. x 1.4 mm vert.
- collimating mirror
  - 0–6 mrad angle of incidence
  - up to 5 mrad hor. acceptance
  - Pd coating
  - internal water cooling
- PSL double-crystal monochromator
  - 4–40 keV energy range
  - 10^{-4} energy resolution ($\Delta E/E$)
  - 30–80 mm beam offset
  - focused beam size 1.4 mm vert. X 0.28 mm hor.
  - magnified beam size 40 mm vert. X 120 mm hor.
- focusing mirror
  - 0–6 mrad angle of incidence
  - up to 5 mrad hor. acceptance
  - Pd coating

Experiment Stations

33-BM-B

- EXAFS
- topography station

33-BM-C

- general purpose scattering station

Detectors

- NaI scintillation counters
- gas-filled proportional counters (Xe, Ar)
- ionization chambers

Beamline Controls and Data Acquisition

- Sun UNIX running EPICS with VME, SPEC

Beamline Support Equipment/Facilities

33-BM-B

- topography station

33-BM-B

- EXAFS table

33-BM-C

- Huber 4-circle diffractometer

Bending Magnet Source Characteristics (nominal)

source	APS bending magnet
critical energy	19.51 keV
on-axis peak brilliance at 16.3 keV	2.9×10^{15} ph/sec/mrad²/mm²/0.1%bw
on-axis peak angular flux at 16.3 keV	9.6×10^{13} ph/sec/mrad²/0.1%bw
on-axis peak horizontal angular flux at 5.6 keV	1.6×10^{13} ph/sec/mradh/0.1%bw
source size at critical energy Σ_x Σ_y	 145 μm 36 μm
source divergence at critical energy $\Sigma_{x'}$ $\Sigma_{y'}$	 6 mrad 47 μrad